Remarks

Reconsideration of this Application is respectfully requested. As the amendments to the claims are believed by the Applicants to address the concerns of the Examiner and 1) to place the application in condition for allowance; 2) that the added claims are merely restating objected claim 25 in independent form and accompanying dependent claims, as suggested by the Examiner; 3) that the claims contain no new matter; 4) the claims have not broadened in scope; and 5) the claims contain no additional matter that would require an additional search or consideration by the Examiner, the Applicants respectfully request that the amendment be entered by the Examiner under 37 C.F.R. § 1.116.

Upon entry of the foregoing amendment, claims 8 and 19-102 are pending in the application, with claims 21, 43, 65, 86 and 100-102 being the independent claims. New claims 103-112 are sought to be added, with claim 103 being independent. Claims 8, 19 and 20 stand withdrawn by the Examiner as being non-elected by the Applicants. Support for the amendment to claims 21, 43, 65 and 86 is found on page 2 lines 27-31. The amendment to claims 37, 59, 80 and 94 was merely a rewording of the claims for clarity and adds no new matter. The amendment to claims 36-38, 40, 58-60, 62, 79-81, 83, 93-95 and 97 merely includes the subject matter of the base claims to eliminate multiply-dependent claims and does not broaden the scope of the claims. New claim 103 is added to independently claim the subject matter of claim 25, as suggested by the Examiner. Claims 104-112 are dependent claims identical in scope with those presented in the amendment filed December 12, 2001. The new claims add no new matter nor change the scope of the previously-presented claims 25 and 33-40. The support for new claims 103-

112 is found in the sequence listing and on pages 18 and 19 of the specification as originally filed. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Rejections under 35 U.S.C. § 112

The Examiner rejected claims 37, 59, 80 and 94 under 35 U.S.C. § 112, second paragraph, as being indefinite. The amendment to the above-mentioned claims clarifies the claimed subject matter and is believed to overcome the rejection. Withdrawal of the rejection is requested.

The Examiner also rejected claims 21-24 and 26-102 under 35 U.S.C. § 112, first paragraph because the Examiner asserted that the specification does not contain sufficient disclosure that the Applicant had possession of the claimed invention at the time the application was filed. The arguments set forth by the Applicants were not deemed persuasive by the Examiner. The Applicants maintain their arguments that there is sufficient written description in the specification to provide disclosure that the Applicant had possession of the claimed invention. However, in the interest of advancing prosecution, the Applicants have amended independent claims 21, 43, 65 and 86 to include language that the polynucleotide encode a polypeptide having C5-epimerase

activity. Thus, the Applicants believe that the concerns of the Examiner have been addressed and request withdrawal of the rejection.

The Examiner also rejected claims 21(a)-(d) and (g)-(m), 22-24, and 26-102 under 35 U.S.C. § 112, first paragraph while being enbaled for polynucleotides comprising nucleotides 73-1404 or 1-1404 of SEQ ID NO: 12, does not reasonably provide enablement for polynucleotides encoding polypeptides of SEQ ID NOs 2-8 or amino acid sequences 1-45, 25-45, 74-86 or 77-97 of SEQ ID NO: 13, and so forth, as set forth on page 4 of the Office Action mailed February 26, 2002. The Applicants continue to maintain that the basis of the rejection is based upon mere assertions by the Examiner, who has not provided factual evidence to support his position. Nevertheless, in order to advance prosecution, the Applicants have amended the claims to include language that the polynucleotide encode a polypeptide having C5-epimerase activity. Thus, the Applicants believe that the concerns of the Examiner have been addressed and request withdrawal of the rejection.

Rejections under 35 U.S.C. § 102

The Examiner has rejected claims 21, 31, 33, 38-40, 43, 53, 55 and 60-62 under 35 U.S.C. § 102(b) as being anticipated by Wilson (Nature *368:*32-38, 1994). The Wilson reference teaches a *C. elegans* sequence of 37881 nucleotide residues. Wilson discusses the sequences of a large part of the *C. elegans* genome with no asserted function. C5-epimerase activity of any of the cloned sequences were discussed in the Wilson article. In addition, the Examiner asserts that SEQ ID NO: 7 was 100%

homologous to a polypeptide sequence encoded by nucleotide residues 10126-10146 of the *C. elegans* sequence. However, a polynucleotide sequence of 21 nucleotides will only code for a 7 amino acid sequence and SEQ ID NO: 7 is an 8 amino acid sequence. Additionally, careful inspection of the sequence by Wilson reveals that the next contiguous nucleotide codon is "GCA" (residues 147-149 of the Wilson sequence), which codes for alanine. The 8th amino acid in SEQ ID NO: 7 is valine. Additionally, the Wilson reference does not teach a host cell, as cited in claims 40, 41, 61, 62, 83, 84, 97 and 98. Therefore, the Wilson reference does not teach each and every aspect of the claimed invention and the Applicants respectfully request that the rejection be withdrawn.

Claims 37, 59, 80 and 94 were rejected under 35 U.S.C. § 102(b) as being anticipated by Voet (*Biochemistry, 2nd Ed.*, 1995, page 966). Voet is drawn to polynucleotides encoding single amino acids. The Examiner asserts that the single amino acids of Voet anticipates the polypeptide with N-terminal, C-terminal, or internal deletion. The Applicants submit that an improper standard has been applied to by the Examiner in the interpretation of Voet and the claims. In the M.P.E.P. § 2106(C) ¶ 5 that "Office personnel must rely on the Applicant's disclosure to properly determine the meaning of terms used in the claims. *Markman v. Westview Instruments*, 52 F.3d 967, 980, 34 USPQ2d 13231, 1330 (Fed. Cir.) (*en banc*), *aff'd* U.S., 116 S. Ct. 1384 (1996)." In paragraph 7, the M.P.E.P. states that "Office personnel are to give claims their broadest *reasonable* interpretation *in light of the supporting disclosure*." [empahsis added by Applicants] The Applicants assert that the Examiner is not giving the claims a

reasonable interpretation in light of the supporting disclosure. It is unreasonable, in light of the specification to interpret the Applicants' intention to claim single amino acids, in light of the disclosure of the polynucleotides and polypeptides, methods of use and methods of making said polynucleotides and polypeptides. Also a practitioner in the field would not interpret the claims to include single amino acids. However, in light of the desire by Applicants to advance prosecution, the amendment made to the claims is thought to overcome the rejection, as single amino acids would not have the cited activity.

The Examiner also rejected claims 86, 87, 90, 91 and 95-98 under 35 U.S.C. § 102(b) as being anticipated by Xue and Cooley (Cell *72:*681-693, 1993). Xue and Cooley discusses a *kelch* gene expressed in *Drosophila* oocytes. The entire article is drawn to the determine of whether there is a structural or sequence homolog to *kelch* and what the function of *kelch* might be. The first open reading frame (ORF1) was discussed on page 689, col. 1, first complete paragraph, as maybe involved in ring canal function in oogenesis, and the function of ORF2 was discussed as being unknown (see page 689, col. 2, first full paragraph). The article by Xue and Cooley do not discuss the claimed function, and therefore, does not teach all the components of the claimed invention. Additionally, the Examiner asserts that the Xue sequence would hybridize to SEQ ID NO: 7 under the listed conditions, without any factual evidence to support his assertion. Additionally, without an algorithm that the U.S.P.T.O. used to determine the sequence alignment and homology, it is uncertain on the part of the Applicants how the Examiner determined the 70% homology listed in the Office Action, and assert that the U.S.P.T.O.

has the burden to prove that the sequence would indeed bind under the conditions listed, absent any evidence to the contrary. For the above reasons, the Applicant believe that the rejection may be properly withdrawn.

Rejections under 35 U.S.C. § 103

The Examiner has rejection claim 99 under 35 U.S.C. § 103(a) as being unpatentable over Xue. The Examiner does not list any reasons why Xue renders the claim unpatentable, other than the conclusionary statement that "[t]herefore, it would have been obvious to one of ordinary skill in the art to express a protein using a host cell comprising the DNA of Xue in order to characterize the encoded protein." However, the Examiner has failed to produce any secondary reference or to provide sound, known scientific reasoning that would support his assertion. There was no explanation of how one of ordinary skill in the art would have been motivated to express the protein listed in the independent claim upon which claim 99 depends, or why one of ordinary skill in the art would have been motivated to express the protein. The Applicants also draw the attention of the Examiner to the arguments listed under 35 U.S.C. § 102(b) *supra*, for their arguments regarding Xue. For these reasons, the Applicants request that the rejection be withdrawn.

Other Matters

The Applicants thank the Examiner for verifying receipt of all priority documents.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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Version with markings to show changes made

21.(Once amended) An isolated polynucleotide comprising a nucleotide sequence encoding a [polypeptide] glucuronyl C5-epimerase capable of converting D-glucuronic acid to L-iduronic acid, the amino acid sequence of which is at least 95% identical to a reference amino acid sequence selected from the group consisting of:

(a) amino acids 1 to 45 of SEQ ID NO: 13;
(b) amino acids 25 to 45 of SEQ ID NO: 13;
(c) amino acids 74 to 86 of SEQ ID NO: 13;
(d) amino acids 77 to 97 of SEQ ID NO: 13;
(e) amino acids 25 to 444 of SEQ ID NO: 13;
(f) amino acids 1 to 444 of SEQ ID NO: 13;
(g) SEQ ID NO: 2;
(h) SEQ ID NO: 3;
(i) SEQ ID NO: 4;
(j) SEQ ID NO: 5;
(k) SEQ ID NO: 6;
(l) SEQ ID NO: 7 and
(m) SEQ ID NO: 8.

36.(Once amended) The polynucleotide of [any one of claims 25-34,] claim 21, wherein said amino acid sequence is selected from a member of the group consisting of SEQ ID Nos. 2, 3, 4, 5, 6, 7 and 8, and wherein said polynucleotide encodes a fusion protein.

37.(Once amended) The polynucleotide of [any one of claims 25-34,] claim 21, wherein said amino acid sequence is selected from a member of the group consisting of SEQ ID Nos. 2, 3, 4, 5, 6, 7 and 8, and wherein said polynucleotide encodes a polypeptide with a deletion of the N-terminal, C-terminal or internal regions.

38.(Once amended) A vector comprising the polynucleotide of [any one of] claim[s] 21[-35].

40.(Once amended) A host cell comprising the polynucleotide of [any one of] claim[s] 21[-35].

43.(Once amended) An isolated polynucleotide encoding a glucuronyl C5-epimerase capable of converting D-glucuronic acid to L-iduronic acid and which hybridizes under the conditions of incubation at 42° C in a solution comprising: 6x SSC, 5x Denhardt's solution containing 0.1% SDS and 0.1 mg/ml denatured salmon sperm DNA, followed by washing in 2x SSC and 0.5% SDS at 42° C, to a polynucleotide encoding a polypeptide selected from the group consisting of:

(a) amino acids 1 to 45 of SEQ ID NO: 13;
(b) amino acids 25 to 45 of SEQ ID NO: 13;

(c) amino acids 74 to 86 of SEQ ID NO: 13;
(d) amino acids 77 to 97 of SEQ ID NO: 13;
(e) amino acids 25 to 444 of SEQ ID NO: 13;
(f) amino acids 1 to 444 of SEQ ID NO: 13;
(g) SEQ ID NO: 2;
(h) SEQ ID NO: 3;
(i) SEQ ID NO: 4;
(j) SEQ ID NO: 5;
(k) SEQ ID NO: 6;
(l) SEQ ID NO: 7 and
(m) SEQ ID NO: 8.

58.(Once amended) The polynucleotide of [any one of claims 47-56,] claim 43, wherein said amino acid sequence is selected from a member of the group consisting of SEQ ID Nos: 2, 3, 4, 5, 6, 7 and 8, and wherein said polynucleotide encodes a fusion protein.

59.(Once amended) The polynucleotide of [any one of claims 47-56,] claim 43, wherein said amino acid sequence is selected from a member of the group consisting of SEQ ID Nos: 2, 3, 4, 5, 6, 7 and 8, and wherein said polynucleotide encodes a polypeptide with a deletion of the N-terminal, C-terminal or internal regions.

60.(Once amended) A vector comprising the polynucleotide of [any one of] claim[s] 43[-57].

62.(Once amended) A host cell comprising the polynucleotide of [any one of] claim[s] 43[-57].

65.(Once amended) An isolated polynucleotide, or an isolated complementary polynucleotide, which encodes a polypeptide having glucuronyl C5-epimerase activity and capable of converting D-glucuronic acid to L-iduronic acid, and which hybridizes under the conditions of incubation at 42° C in a solution comprising: 6x SSC, 5x Denhardt's solution containing 0.1% SDS and 0.1 mg/ml denatured salmon sperm DNA, followed by washing in 2x SSC and 0.5% SDS at 42° C, to said isolated polynucleotide selected from the group consisting of:

(a) nucleotides 73 to 207 of SEQ ID NO: 12;
(b) nucleotides 73 to 1404 of SEQ ID NO: 12;
(c) nucleotides 73 to 3085 of SEQ ID NO: 12;
(d) nucleotides 145 to 207 of SEQ ID NO: 12;
(e) nucleotides 292 to 329 of SEQ ID NO: 12;
(f) nucleotides 301 to 362 of SEQ ID NO: 12;
(g) nucleotides 145 to 1404 of SEQ ID NO: 12;
(h) nucleotides 145 to 3085 of SEQ ID NO: 12;
(i) nucleotides 1 to 1404 of SEQ ID NO: 12 and
(j) nucleotides 1 to 3085 of SEQ ID NO: 12;

79.(Once amended) The polynucleotide of [any one of claims 66-77,] claim 65, wherein said polynucleotide sequence is selected from a member of the group consisting of

(a) nucleotides 73 to 207 of SEQ ID NO: 12;
(b) nucleotides 73 to 1404 of SEQ ID NO: 12;
(c) nucleotides 73 to 3085 of SEQ ID NO: 12;
(d) nucleotides 145 to 207 of SEQ ID NO: 12;
(e) nucleotides 292 to 329 of SEQ ID NO: 12;
(f) nucleotides 301 to 362 of SEQ ID NO: 12;
(g) nucleotides 145 to 1404 of SEQ ID NO: 12;
(h) nucleotides 145 to 3085 of SEQ ID NO: 12;
(i) nucleotides 1 to 1404 of SEQ ID NO: 12 and
(j) nucleotides 1 to 3085 of SEQ ID NO: 12;

and wherein said polynucleotide encodes a fusion protein.

80.(Once amended) The polynucleotide [of any one of claims 66-77,] claim 65, wherein said polynucleotide sequence is selected from a member of the group consisting of

(a) nucleotides 73 to 207 of SEQ ID NO: 12;
(b) nucleotides 73 to 1404 of SEQ ID NO: 12;
(c) nucleotides 73 to 3085 of SEQ ID NO: 12;
(d) nucleotides 145 to 207 of SEQ ID NO: 12;
(e) nucleotides 292 to 329 of SEQ ID NO: 12;
(f) nucleotides 301 to 362 of SEQ ID NO: 12;
(g) nucleotides 145 to 1404 of SEQ ID NO: 12;
(h) nucleotides 145 to 3085 of SEQ ID NO: 12;
(i) nucleotides 1 to 1404 of SEQ ID NO: 12 and
(j) nucleotides 1 to 3085 of SEQ ID NO: 12;

and wherein said polynucleotide encodes a polypeptide with a deletion of the N-terminal, C-terminal or internal regions.

81.(Once amended) A vector comprising the polynucleotide of [any one of] claim[s] 65[-78].

83.(Once amended) A host cell comprising the polynucleotide of [any one of] claim[s] 65[-78].

86.(Once amended) An isolated polynucleotide, which encodes a polypeptide having glucuronyl C5-epimerase activity and capable of converting D-glucuronic acid to L-iduronic acid, or an isolated complementary polynucleotide, which hybridizes under the conditions of incubation at 42° C in a solution comprising: 6x SSC, 5x Denhardt's solution containing 0.1% SDS and 0.1 mg/ml denatured salmon sperm DNA, followed by washing in 2x SSC and 0.5% SDS at 42° C, to said isolated polynucleotide, or its complement selected from the group consisting of:

(a) SEQ ID NO: 9;
(b) SEQ ID NO: 10 and

(c) SEQ ID NO: 11.

93.(Once amended) The polynucleotide of [any one of claims 87-91,] claim 86, wherein said polynucleotide sequence is selected from a member of the group consisting of SEQ ID Nos: 9, 10 and 11 and wherein said polynucleotide encodes a fusion protein.

94.(Once amended) The polynucleotide of [any one of claims 87-91,] claim 86, wherein said polynucleotide sequence is selected from a member of the group consisting of SEQ ID Nos: 9, 10 and 11 and wherein said polynucleotide encodes a polypeptide with a deletion of the N-terminal, C-terminal or internal regions.

95.(Once amended) A vector comprising the polynucleotide of [any one of] claim[s] 86[-92].

97.(Once amended) A host cell comprising the polynucleotide of [any one of] claim[s] 86[-92].

New claims 103-112 were added.